ELECTRICAL ISOLATION OF ELECTRO-OPTIC COMPONENTS IN PHOTONIC INTEGRATED CIRCUITS (PICs)

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REFERENCE TO RELATED APPLICATION

[0001] This application is a continuation of patent application, Serial No. 10/283,476, filed October 30, 2002, which application claims priority to U.S. provisional application, Serial No. 60/402,801, filed June 21, 2002, which applications are incorporated herein by reference.

BACKGROUND OF THE INVENTION

Field of the Invention

[0002] This invention relates generally to photonic integrated circuits (PICs), including electro-absorption modulators/lasers (EMLs), and more particularly to electrical isolation of electro-optical components in such circuits.

Description of the Related Art

[0003] In photonic integrated circuits or PICs, two or more active or electro-optical components as well as possibly at least one passive optical component are generally integrated on a single semiconductor or other type of chip. A well known example of this kind of PIC chip is an EML (Electro-absorption Modulator/Laser) where, for example, a distributed feedback (DFB) laser is integrated with an electro-optical modulator such as illustrated, for example, in U.S. patent 6,148,017, employing the InGaAsP/InP regime. There are many such examples of EMLs in the art and this just one recent example of this type of device. In order that there is no electrical interference between the operation of these integrated electro-optical components, an electrical isolation region (which is shown at reference number 5 in the above mentioned patent), which is usually an isolation trench, is generally deployed between such optical components. The trench usually extends down into the bulk of the PIC chip as far as the upper confinement layer, for example, above the active region of the PIC chip. However, it is desirable not to extend such a trench too far into the chip so as to perturb the optical mode propagating in the active region of the device as well as cause significant backward reflections of the optical mode since such a trench can function as a partial mirror to the propagating mode.